



# PHYTO-NUTRACEUTICALS

# • PHYTOCHEMICALS:

Phytochemicals could provide health benefits as:

1. Substrate for biochemical reactions
2. Cofactors of enzymatic reactions
3. Inhibitors of enzymatic reactions
4. Absorbents that bind to & eliminate undesirable constituent in the intestine
5. Scavengers of reactive or toxic chemicals

- 6. Enhance the absorption and / or stability of essential nutrients**
- 7. Selective growth factor for beneficial bacteria**
- 8. Fermentation substrate for beneficial bacteria**
- 9. Selective inhibitors of deleterious intestinal bacteria**

# VARIOUS PHYTOCHEMICALS

<b>Phytochemicals</b>	<b>Source</b>	<b>Role</b>
Tocotrienols & tocopherols	Grains	Suppressed the growth of diverse tumors cell lines via initiation of apoptosis and concomitant arrest of cells in the G1 phase of the cell cycle
Carotenoids	Fruits & vegetables	Antioxidants, protects against uterine, prostate, colorectal, lung and digestive tract cancers, and protection to other antioxidants.

Limonoids

CITRUS FRUITS

Inhibiting phase I enzymes & inducing phase II detoxification enzymes in liver, provide protection to lung tissue.

Phytosterols

Various plants

Exhibit anti-inflammatory,

Phenolic constituents

Various plants, wholegrain

Flavonoids

GRAPES, WINES

Action against free radicals, free radicals mediated cellular signaling, inflammation, allergies, platelet aggregation, & hepatotoxins

Catechin & gallic acids

Grapes, berries, cocoa, green tea, acacia spp.

Antioxidants, free radical scavenging ability, inhibition of eicosanoid synthesis, reduces CHD

Treating cancers & osteoporosis

Isoflavonoids

Soybeans

Anthocyanidins

Fruits & flowers

Antioxidants & anti-mutagenic properties

Glucosinolates

Cruciferous

Activators of liver detoxification enzymes, inhibit the neoplastic effect of various carcinogens

Indoles

Reduces estrogen-dependent cancer risk,

Fiber

Various vegetables, fruits,

Protects against colorectal diseases,

# METHOD TO ENHANCE ACTIVE COMPONENTS IN FOOD

- Manipulating the diet to get maximum level of active components
- Combination of food ingredients rich in nutraceuticals
- Fortifying food with active ingredients
- By fermentation of food products
- Changing food habits to natural type of diet



# SOME HEALTHIEST FRUITS AND VEGETABLES

## VEGETABLES

## BODY BENEFITS

1) Broccoli

This food is loaded with sulphoraphane ,consisting 72 mg of calcium,78 mcg of folic acid and vitamin C

2) Cabbage

The indoles in a cabbage makes it a cancer fighter

3) Carrots

A stellar source of beta-carotene.one carrot contains twice the RDA for vit-A

4) Tomatoes

Technically consider as a fruit loaded with cancer fighting lycopene and a great source of vit-A

## FRUITS

## BODY BENEFITS

1) Apples

An apple's 3 gm of fibre help you meet your fibre goal of 20g to 30 g daily. High fibre diets can lower high disease risk

2) Apricots

A good source of beta carotene (which is converted to vit-A by the body)

providing the equivalent of 35% of RDA for vit-A

3) Bananas

They are the great source of potassium, which plays great role in heart and muscles function

4) Cherries

Heart protective anthocyanins are present and also gives colour

5) Papayas

Loaded with vit-C with beta-carotene and calcium